

ASTARIS PRODUCTION LLC (PWS 6150040)
SOURCE WATER ASSESSMENT FINAL REPORT

November 19, 2002



State of Idaho
Department of Environmental Quality

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Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the well and aquifer characteristics.

This report, *Source Water Assessment for Astaris Production LLC, Caribou County, Idaho*, describes the public water system (PWS), the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The Astaris Production (PWS # 6150040) drinking water system is classified as a non-community, non-transient water system. The drinking water system has one well source. The well serves approximately 65 persons through one connection.

The Dry Valley Creek is the potential contaminant source that crosses the delineated capture zones. If an accidental spill occurred into this corridor, inorganic chemical (IOC) contaminants, volatile organic chemical (VOC) contaminants, synthetic organic chemical (SOC) contaminants, or microbial contaminants could be added to the aquifer system. A complete list of potential contaminant sources is provided with this assessment (Table 1).

For the assessment, a review of laboratory tests was conducted using the State Drinking Water Information System (SDWIS). The IOCs arsenic, chromium, fluoride, and nitrate have been detected in the drinking water, but at levels below the maximum contaminant level (MCL) for each chemical. Total coliform bacteria were detected at various locations in the distribution system. No VOCs or SOCs have been detected in the drinking water.

Final susceptibility scores are derived from equally weighted system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in another category results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential contaminants are divided into four categories: IOCs (i.e., nitrates, arsenic), VOCs (i.e., petroleum products), SOCs (i.e., pesticides), and microbial contaminants (i.e., bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

The final susceptibility rankings for the well are moderate for IOCs, VOCs, SOCs, and microbials. System construction and hydrologic sensitivity rated high. Potential contaminant inventory and land use scores were low for IOCs, VOCs, SOCs, and microbials.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For Astaris Production LLC, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system’s components and its capacity). The system should consider disinfection practices if microbial problems continue and/or arise. No potential contaminants (pesticides, paint, fuel, cleaning supplies, etc.) should be stored or applied within 50 feet of the well. Land uses within most of the source water assessment area are outside the property boundary for Astaris Production LLC. Therefore, partnerships with state and local agencies, and industrial and commercial groups should be established to ensure future land uses are protective of ground water quality.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan. Public education topics could include proper hazardous waste disposal methods and the importance of water conservation. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture and the Caribou County Soil and Water Conservation District.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (e.g. zoning, permitting) or non-regulatory in nature (e.g. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Pocatello Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR ASTARIS PRODUCTION LLC, CARIBOU COUNTY, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this assessment means.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are included. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is included.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the well, and aquifer characteristics. All assessments must be completed by May of 2003. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water supply system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the public water system (PWS).**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. DEQ recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The Astaris Production (PWS # 6150040) drinking water system is classified as a non-community, non-transient water system. The drinking water system has one well source. The well serves approximately 65 persons through one connection. The inorganic chemicals (IOCs) arsenic, chromium, fluoride, and nitrate have been detected in the drinking water, but at levels below the maximum contaminant level (MCL) for each chemical. Total coliform bacteria were detected at various locations in the distribution system. No volatile organic chemicals (VOCs) or synthetic organic chemicals (SOCs) have been detected in the drinking water.

Defining the Zones of Contribution – Delineation

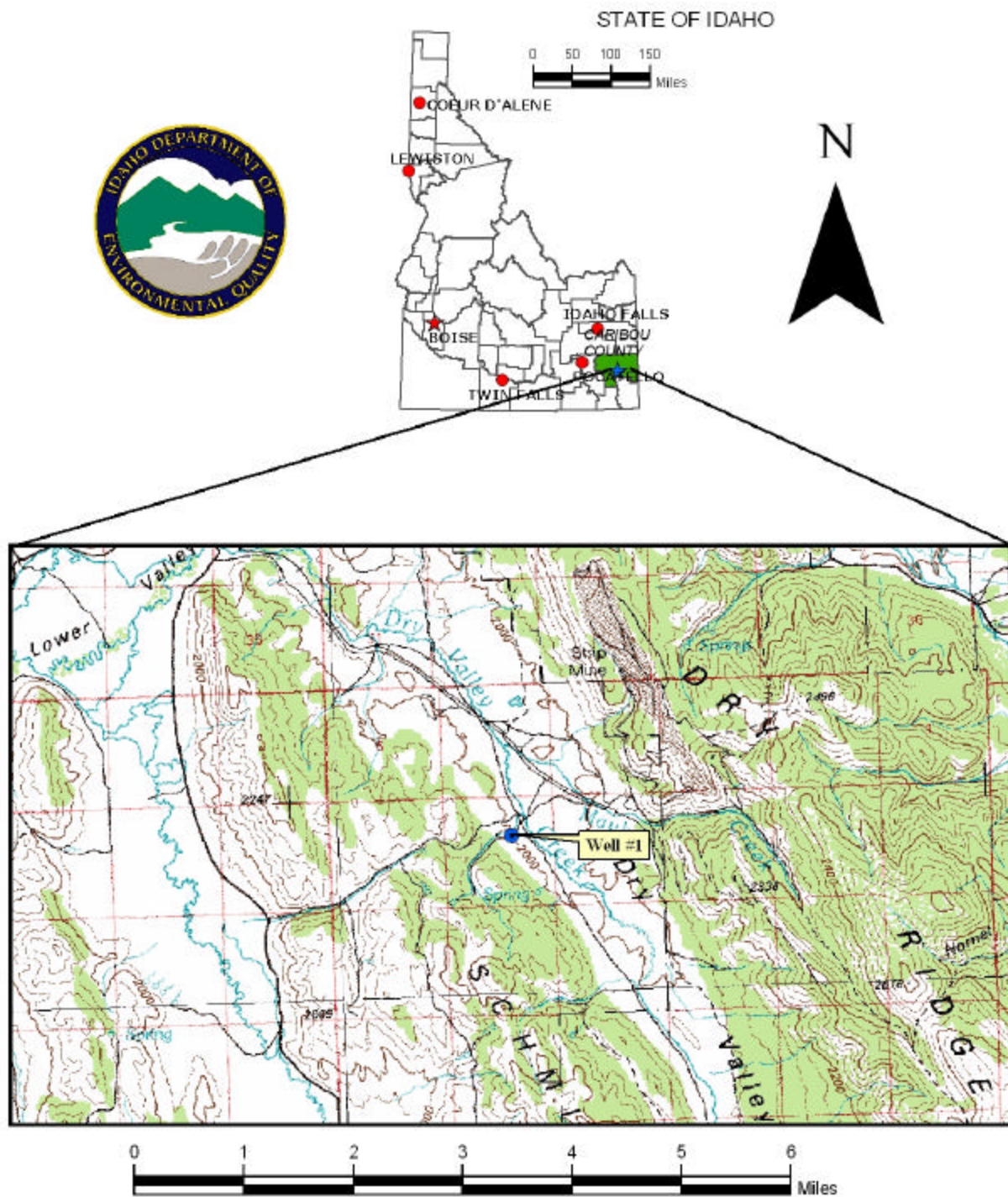
The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a pumping well) for water in the aquifer. Washington Group International (WGI) was contracted by DEQ to define the public water system's zones of contribution. WGI used a conceptual computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Upper Blackfoot hydrologic province in the vicinity of the Astaris Production LLC. The computer model used site specific data, assimilated by WGI from a variety of sources including operator records, well logs (when available) and hydrogeologic reports. A summary of the hydrogeologic information from the WGI is provided below.

Hydrogeologic Conceptual Model

The Upper Blackfoot hydrologic province is southwest trending with northwest and southeast trending finger-like projections. The principal aquifers are unconsolidated valley-fill materials and the underlying Dinwoody, Phosphoria, and Wells Formations made up of limestone, sandstone, siltstone, dolomite, chert, and shale (BLM, 2000, p. 3-46; Graham and Campbell, 1981, p. 21; and Ralston et al. 1979, p. 26).

The mountains and valleys bounding and within the Upper Blackfoot hydrologic province were formed during two events separated by approximately 50 to 70 million years (Alt and Hyndman, 1991, pp. 329 and 336). The overthrust belt of the northern Rocky Mountains was formed approximately 70 to 90 million years ago through the intrusion of granitic magma and a massive eastward movement of large slabs of layered sedimentary rocks along faults that dip shallowly westward (Alt and Hyndman, 1991, p. 329). This movement caused extreme folding and fracturing of the sedimentary and granitic rocks and, in many cases, left older formations lying on top of younger ones. Later Basin and Range block faulting broke up the largely eroded Rocky Mountains into large uplifted and downthrown blocks resulting in the present day northwest trending mountains and valleys seen throughout southeastern Idaho. Paleozoic and Precambrian age limestone, dolomite, sandstone, shale, siltstone, and quartzite are the predominant materials forming the mountains and underlying the valleys between Salmon, Idaho on the north side of the Snake River Plane and Franklin, Idaho near the Utah/Idaho border (Dion, 1969, p.18; Kariya et al., 1994, p. 6; Bjorkland and McGreevy, 1971, p. 12; and Parlman, 1982, p. 9). Ground water movement in the mountains is primarily through a system of solution channels, fractures, and joints that commonly transmit water independently of surface topography (Bjorklund and McGreevy, 1971, p. 15; Dion, 1969, p. 18). Ralston et al. (1979, pp. 128-129) states that the geologic structural features also can contribute to the development of cross-basin ground water flow systems. Ground water entering a geologic formation tends to follow the formation because the hydraulic conductivity tends to be higher parallel to bedding planes and lower across bedding planes. Synclines and anticlines provide structural avenues for ground water flow under ridges from one valley to another. Faults are associated with the location of many springs.

FIGURE 1- GEOGRAPHIC LOCATION OF ASTARIS PRODUCTION
LLC WELL#1, PWS 6150040



Graham and Campbell (1981, p. 21) list the major sources of aquifer recharge in the Upper Blackfoot hydrologic province as percolation of precipitation and snowmelt into the alluvium, infiltration into the outcrop areas of bedrock formations, and leakage from tributaries to the Blackfoot River. They also state that in places the alluvial aquifers recharge the bedrock aquifers, while in other areas the alluvium is recharged by the bedrock aquifers. Ground water discharge occurs as springs and seeps issuing from faults, fractures, and solution channels, and as underflow to adjacent aquifers.

Ground water in the area surrounding the Astaris Production LLC PWS flows through both the valley-fill alluvium and underlying bedrock. The alluvium is present along the valley floor and covers some of the shallow slopes adjacent to the floor. Alluvial deposits consist of poorly sorted gravel, sand, silt, and clay and have low to moderate permeability. Bedding planes, fractures, and faults are the primary avenues for ground water flow within the bedrock (BLM, 2000, Appendix D, p. 2). The bedrock consists of the Wells, Phosphoria, Dinwoody, and Thaynes formations. The Wells Formation lies directly below the alluvium east of the FMC PWS well and along the east side of the valley. It consists primarily of interbedded limestone, sandstone, and dolomite and is generally the most transmissive of the bedrock formations (BLM, 2000, p. 3-39). The Meade Peak Member of the Phosphoria Formation overlies the Wells Formation on the west side of the valley near the FMC PWS well. This phosphatic shale and limestone member of the Phosphoria Formation is relatively impermeable and, as a result, functions as an aquitard between the Wells Formation and the Rex Chert. The Rex Chert Member of the Phosphoria Formation overlies the Meade Peak Member and consists primarily of chert and shale of low to moderate permeability. The Dinwoody and Thaynes Formations overlie the Phosphoria Formation, outcropping along Schmid Ridge west of Dry Valley (BLM, 2000, pp. 3-39 to 3-46).

Recharge occurs in Dry Valley from percolation of rainfall and snowmelt into the alluvium and bedrock aquifers. The alluvial aquifer is also recharged by stream infiltration and springs issuing from bedrock sources. In turn, the alluvial aquifer recharges the underlying Wells and Rex Chert aquifers. Water in these bedrock aquifers then flows under Schmid Ridge and discharges in Slug Creek Valley (BLM, 2000, p. 3-47).

The precipitation on the floor of Dry Valley was 20 inches for the one-year period from September 1974 to September 1975 (Ralston and Trihey, 1975, p. 10). Precipitation was 25 inches during the same period on Dry Ridge to the east of the valley and 35 inches on Schmid Ridge to the west.

In general, ground water flow in the bedrock system is down stratigraphic dip (east to west) from the recharge area in Dry Valley beneath Schmid Ridge to the discharge area in Slug Creek Valley (BLM, 2000, pp. 3-46 and 3-47). A smaller component of ground water flow in the bedrock system is from the southeast to the northwest along bedding strike toward the Blackfoot River. This southeast to northwest component is expected to be minor because of the relatively low hydraulic gradients of 0.001 to 0.0025 ft/ft (BLM, 2000, pp. 3-46 and 3-47).

The alluvial and bedrock aquifers show a large variability in hydraulic characteristics. Transmissivities of less than 1,000 gal/day/ft are typical for the alluvial and Meade Peak units. Transmissivities of greater than 1,000 gal/day/ft are typical for the Wells and Rex Chert units (BLM, 2000, p. 3-47). Hydraulic conductivity estimates for phosphatic shale are as low as 0.07 ft/day (unfractured) and as large as 25 ft/day (fractured). Published hydraulic conductivity estimates for alluvium range from 0.2 to 55 ft/day (BLM, 2000, p. 3-48, and Ralston et al., 1979, p. 31). Hydraulic conductivity ranges from 1.2 to 75 ft/day for fractured chert and from 0.1 to 50 ft/day for sedimentary rock of the Wells

Formation (BLM, 2000, p. 3-48). Storage coefficients for the bedrock range from 0.0001 to 0.01, indicating confined to semi-confined conditions (BLM, 2000, p. 3-47).

Delineation Method

The refined method using the analytical element model WhAEM (Kraemer et al., 2000) was used for the delineation of the Astaris Production LLC well. A uniform ground water flow gradient was specified using the uniform flow option in WhAEM. This approach was used because there are no water level data available with which to calibrate a fully deterministic model.

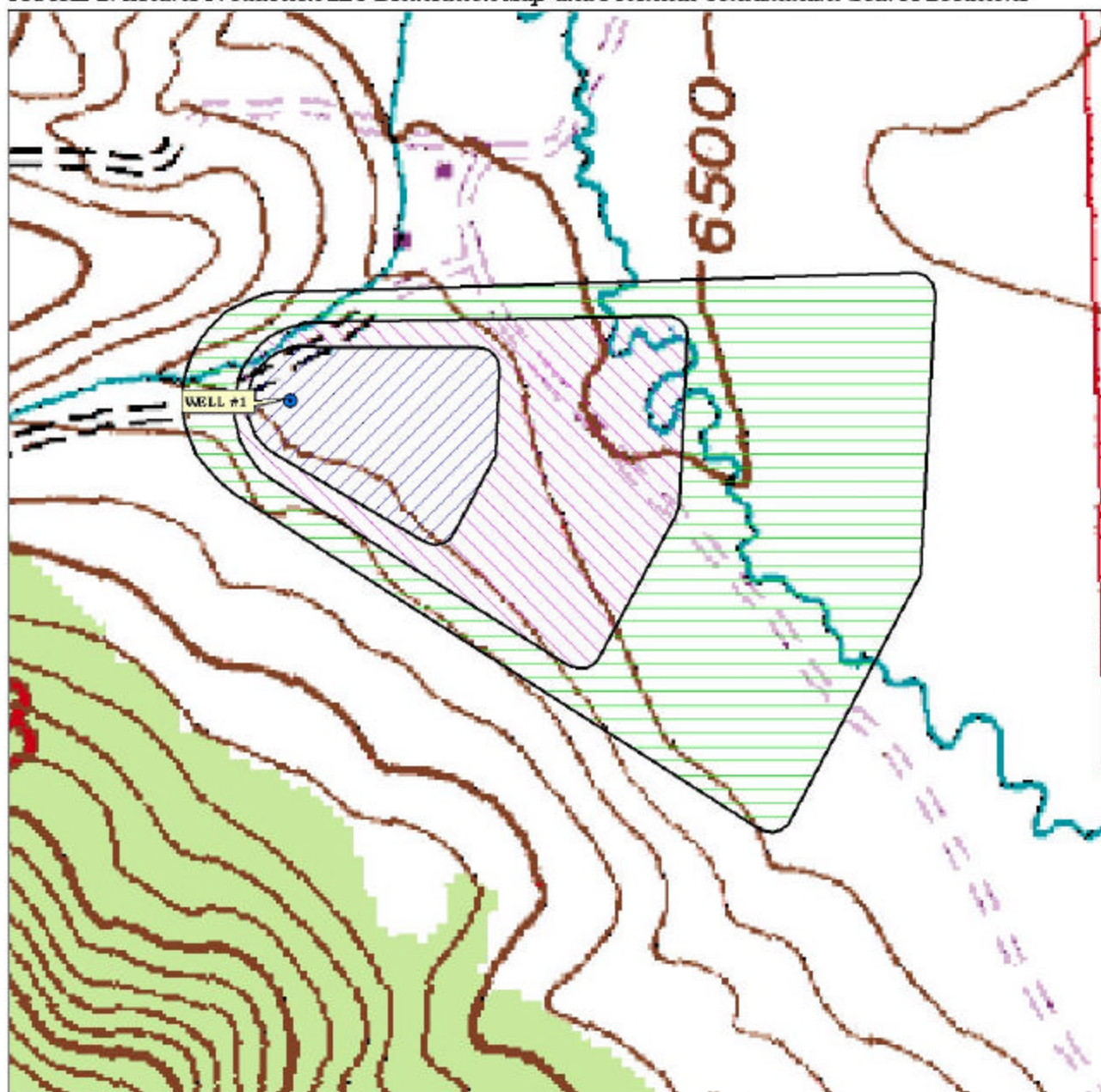
The pumping rate for the Astaris well is 1.5 times the average daily pumping rate. The hydraulic conductivity is 8.6 ft/day. This is the geometric mean of estimates derived from (1) the analysis of the FMC PWS well specific capacity data using the method of Walton (1962, p.12) and (2) the Dry Valley Mine Environmental Impact Statement for the Rex Chert Member (see Attachment B; BLM, 2000, p. 3-48). The effective porosity (0.2) and hydraulic gradient (0.003) are the default values for mixed volcanic and sedimentary rocks, primarily sedimentary rocks, presented in Table F-3 of the Idaho Wellhead Protection Plan (IDEQ, 1997, p. F-6). The aquifer thickness (130 feet) is the perforated interval for the FMC PWS well. The flow direction is to the west by northwest (157.5 degrees from due east) based on the flow directions presented by the BLM (2000, pp. 3-46 and 3-47).

The delineated source water assessment areas for the Astaris Production LLC well trends in an east southeasterly direction approximately 0.4 miles and widens to approximately 0.2 miles, covering 36.5 acres (Figure 2). The actual data used by WGI in determining the source water assessment delineation areas are available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act. Furthermore, these sources have a sufficient likelihood of releasing such contaminants into the environment at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. Field surveys conducted by DEQ and reviews of available databases identified Dry Valley Creek as the potential contaminant source within the delineation areas.

FIGURE 2. Astaris Production LLC Delineation Map and Potential Contaminant Source Locations



PWS# 6150040
WELL #1

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply source.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted in August 2002. The first phase involved identifying and documenting potential contaminant sources within the Astaris Production LLC source water assessment areas through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to validate the sources identified in phase one and to add any additional potential sources in the area. This task was undertaken with the assistance of Mr. James Williams. At the time of the enhanced inventory, no additional potential contaminant sources were found within the delineated source water area. A map with the well location, delineated areas, and potential contaminant sources are provided with this report (Figure 2). The potential contaminant source(s) have been listed in Table 1.

Table 1. Astaris Production LLC, Well #1, Potential Contaminant Inventory

Site #	Source Description	TOT Zone (in years)	Source of Information	Potential Contaminants ¹
	Dry Valley Creek	3-6: 6-10	GIS Map	IOC, VOC, SOC

¹ IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Section 3. Susceptibility Analyses

The susceptibility of the well to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for the well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Appendix A contains the susceptibility analysis worksheet. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors. These factors are surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone (aquiclude) above the producing zone of the well. Slowly draining soils such as silt and clay have better filtration capabilities and therefore are typically more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Hydrologic sensitivity was rated high for the well (Table 2). This is based upon moderate to well drained regional soil classes, as defined by the National Resource Conservation Service (NRCS), being located within the delineated area. The well log indicates the vadose zone is comprised predominantly of high permeability materials and an aquiclude is not present.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

The system construction score was rated high for the well (Table 2). The 2000 sanitary survey (conducted by the Southeastern District Health Department) indicates the well casing does not have a well vent. The purpose of the vent is to vent the space between the casing and the column and prevent a vacuum from forming when the well turns on and draws down the water table. A vacuum could draw in contamination through joints or leaks in the casing or cause the well to slough.

The well log indicates the well was drilled in 1977 to a depth of 185 feet below ground surface (bgs). The 8-inch diameter steel casing extends 185 feet into chert rock and the annular seal extends 15 feet into chert rock. The well is perforated from 50 feet to 180 feet. The highest production zone of the well is less than 100 feet below the static water level. In March of 1977 the static water level was recorded at 14 feet bgs. The well is located outside of a 100-year floodplain and the well casing height is adequate.

The Idaho Department of Water Resources (IDWR) *Well Construction Standards Rules (1993)* require all PWSs to follow DEQ standards. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works (1997)* during construction. Under current standards, all PWS wells are required to have a 50-foot buffer around the wellhead and if the well is designed to yield greater than 50 gallons per minute (gpm) a minimum of a 6-hour pump test is required. These standards are used to rate the system construction for the well by evaluating items such as condition of wellhead and surface seal, whether the casing and annular space is within consolidated material or 18 feet below the surface, the thickness of the casing, etc. If all criteria are not met, the public water source does not meet the IDWR Well Construction Standards. In this case, the casing thickness was less than the recommended IDWR standards for a PWS of 0.322 inches for an 8-inch diameter casing as listed in the *Recommended Standards for Water Works (1997)*. A thicker casing for a public water source may prolong the life of the well. Therefore, the well received a conservatively high rating in terms of system construction susceptibility to contamination.

Potential Contaminant Source and Land Use

The potential contaminant sources and land use within the delineated zones of water contribution are assessed to determine the well's susceptibility. For instance, when agriculture is the predominant land use in the area, this may increase the likelihood of agricultural wastewater infiltrating the ground water system. Agricultural land is counted as a source of leachable contaminants and points are assigned to this rating based on the percentage of agricultural land. Caribou County is considered to have high herbicide use.

In terms of potential contaminant sources, the well rated low for IOCs (i.e., nitrates), VOCs, (i.e., petroleum related products), SOC (i.e., pesticides), and microbials (i.e., bacteria) (Table 2).

The potential contaminant source found within the delineated areas is the Dry Valley Creek. The location of this potential contaminant source and delineated TOT zones for the well is shown on Figure 2.

Final Susceptibility Ranking

A detection above a drinking water standard MCL or any detection of a VOC or SOC at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. Additionally, potential contaminant sources within 50 feet of a wellhead will automatically lead to a high susceptibility rating. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0- to 3-year time of travel zone (Zone 1B) contribute greatly to the overall ranking.

Table 2. Summary of Astaris Production LLC Susceptibility Evaluation

Drinking Water Source	Susceptibility Scores ¹									
	Hydrologic Sensitivity	Potential Contaminant Inventory and Land Use				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well	H	L	L	L	L	H	M	M	M	M

¹H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

In terms of total susceptibility, the well rated moderate for IOCs, VOCs, SOCs, and microbials. System construction and hydrologic sensitivity rated high. Potential contaminant land use scores were low for IOCs, VOCs, SOCs, and microbials.

The IOCs arsenic, chromium, fluoride, and nitrate have been detected in the drinking water, but at levels below the MCL for each chemical. Total coliform bacteria were detected at various locations in the distribution system. No VOCs or SOCs have been detected in the drinking water.

Section 4. Options for Drinking Water Protection

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For Astaris Production LLC, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey. No potential contaminants (pesticides, paint, fuel, cleaning supplies, etc.) should be stored or be applied within 50 feet of the well. Land uses within most of the source water assessment area are outside the property boundary for Astaris Production LLC. Therefore, partnerships with state and local agencies, and industrial and commercial groups should be established to ensure future land uses are protective of ground water quality. Educating employees and the public about source water will further assist the system in its monitoring and protection efforts.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture and the Caribou County Soil and Water Conservation District.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (e.g. zoning, permitting) or non-regulatory in nature (e.g. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Pocatello Regional Office of the DEQ or the Idaho Rural Water Association.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Pocatello Regional DEQ Office (208) 236-6160

State DEQ Office (208) 373-0502

Website: <http://www.deq.state.id.us>

Water suppliers serving fewer than 10,000 persons may contact Ms. Melinda Harper at (208) 343-7001 or email her at mlharper@idahoruralwater.com for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLA – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund, is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100-year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands).

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5 mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25% of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RCRA – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

References Cited

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Attachment A

Astaris Production LLC Susceptibility Analysis Worksheet

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

- 0 - 5 Low Susceptibility
- 6 - 12 Moderate Susceptibility
- ≥ 13 High Susceptibility

1. System Construction

SCORE

Drill Date	03/01/1977	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	2002
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		5

2. Hydrologic Sensitivity

Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
Total Hydrologic Score		6

3. Potential Contaminant / Land Use - ZONE 1A

IOC Score	VOC Score	SOC Score	Microbial Score
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Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	0	2	0

Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	NO	0	0	0	0
(Score = # Sources X 2) 8 Points Maximum		0	0	0	0
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
4 Points Maximum		0	0	0	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		0	0	0	0

Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		3	3	3	0

Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0

Cumulative Potential Contaminant / Land Use Score

7	5	7	0
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4. Final Susceptibility Source Score

12	12	12	11
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5. Final Well Ranking

Moderate	Moderate	Moderate	Moderate
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